

IV

VULVO-VAGINITIS*

By B. BUCKLEY SHARP, M.D., M.S., M.R.C.P.

MR. PRESIDENT, LADIES AND GENTLEMEN,

The material upon which this paper is based is the experience of the treatment of vulvo-vaginitis at the Hospital for Sick Children, Great Ormond Street, in the Venereal Disease Department, of which the Director is Dr. Nabarro.

The period covered is from 1917 to 1929 inclusive, my own association with the Department being from 1923 to 1929 inclusive.

During the period 1917 to 1928 (twelve years), 1,219 cases, in which inflammation of, or discharge from, the vulva was complained of, were investigated. Of these, 249 were definitely suffering from gonorrhœa, 949 were definitely not gonorrhœa, while 21 were recorded as doubtful. Thus, just over one quarter of the cases were gonorrhœal. This proportion does not agree with those of some other observers; for example, Dr. David Lees¹ in an analysis of 146 cases reported in January, 1928, found 80·3 per cent. to be due to infection by the gonococcus. Recently there has been correspondence in the Medical Press casting some doubt upon the identity of the Gram-negative diplococci found in the vulvo-vaginitis of children with the gonococcus. I do not think that anyone here will doubt the identity, as frequently there is strong evidence of the infection being passed from an adult, suffering from undoubted gonorrhœa, to a female child.

I propose to consider the gonorrhœal cases first, and I have included in my series the cases attending in 1929, 12 in number, but only in the parts of this paper dealing with *sources of infection and treatment*.

DIAGNOSIS

I agree with Dr. Lees that acute gonorrhœal vulvo-vaginitis can be diagnosed clinically with certainty in

* Paper No. 2, read before the Medical Society for Study of Venereal Diseases, on March 28th, 1930.

almost every case. There is a profuse purulent vaginal discharge, yellow, greenish or blood-stained, visible at the anterior end of the vulval cleft before separation of the labia. Gonococci without other organisms will be seen in the Gram-stained smears, and it is hardly worth while in these cases to make cultures. Usually the organisms will be intra-cellular. In the very early cases before the disease has become acute they may be still extra-cellular. It is in children under one year old, in the chronic old-standing cases, and in treated cases, that the difficulties in diagnosis arise, owing to slightness or absence of signs, and thus bacteriological tests of cure must be oft repeated over a considerable period, and cultures must be made in addition to direct smears. I feel convinced that those not thoroughly experienced in examining smears will tend to diagnose gonorrhœa when it is not present rather than err in the other direction. There are many other organisms that can mimic the gonococcus in smears, such as *B. coli*, staphylococci, and intestinal streptococci, and the latter two may fail to take the Gram stain and may be intra-cellular. However, they vary in size, and a skilled pathologist will be able to distinguish them. The presence of mixed organisms in an early case makes it unlikely that the case is one of gonorrhœa. Where there is any doubt, films and cultures should be made on three occasions before the result is considered negative. To grow the gonococcus, of course, proves the diagnosis, but this is by no means easy in primary culture; and where mixed infections are present there is a possibility of the media being overgrown with *B. coli*. The medium we used at Great Ormond Street was Thompson's medium, obtained from St. Thomas' Hospital, which is, I believe, a hydrocele fluid agar. I can only regard it as moderately successful as judged by the occasions on which cases typical clinically, and with typical smears, have failed to give positive cultures. I regard a better medium as being a blood-serum agar as prepared by my friend Dr. P. O. Ellison.

It is essential to have the medium warmed to 37° C. before it is sown. And it must then be kept warm until it reaches the incubator. Incubate up to four days before giving a negative report.

The colonies of gonococcus are small and translucent, and are soluble in dilute caustic soda, producing a sticky

VULVO-VAGINITIS

solution. Microscopically the Gram-negative kidney-shaped cocci are seen in pairs or fours. Sugar reactions can be used to differentiate the gonococcus from *Micrococcus catarrhalis* and from meningococcus; gonococcus fermenting glucose, the meningococcus maltose, and the *Micrococcus catarrhalis* neither. Meningococcus rarely, if ever, occurs in the vagina, but Schauffler states in the *American Journal of Children's Diseases*, October, 1927, that the *Micrococcus catarrhalis* is not uncommon, especially in the first two weeks of life.

AGE INCIDENCE

Analysis of the years 1917 to 1928 inclusive show the highest incidence between the ages of 2 and 5 years. From the age of 5 onwards the incidence rapidly declines. The disease is rare under the age of 1 year unless there is a hospital epidemic among infants, and out of a total of 11 cases in 12 years in my series, 6 occurred in 1926 from such a cause in another hospital, and one in 1924.

I now show a graph to illustrate this age incidence, which rather surprisingly shows a fall at school age.

SEASONAL INCIDENCE

It will be seen from the accompanying graph that the highest seasonal incidence was in the third quarter of the year, lowest in the fourth, and second highest in the first quarter, the year being divided into quarters of three calendar months each. Thus, the third quarter comprises the months of July, August and September. I can only attempt to explain this by the fact that it is my impression that the highest incidence of gonorrhœa in adults is in the summer months, at any rate in the hospital classes, probably owing to the increased opportunities of infection afforded by warm summer evenings. The scanty, and sometimes absent, under-garments of the children of the poor in summer may render them more prone to the risks of accidental infection. It must be conceded, I think, that the *source of infection* in female children is directly or indirectly from an infected adult. It may, of course, be through the agency of another child, or *viâ* an inanimate object such as a towel, sponge, lavatory, thermometer, enema nozzle, or bedclothes. In

BRITISH JOURNAL OF VENEREAL DISEASES

the 146 cases analysed by Lees he gave the following results.

Forty per cent. source not traced.

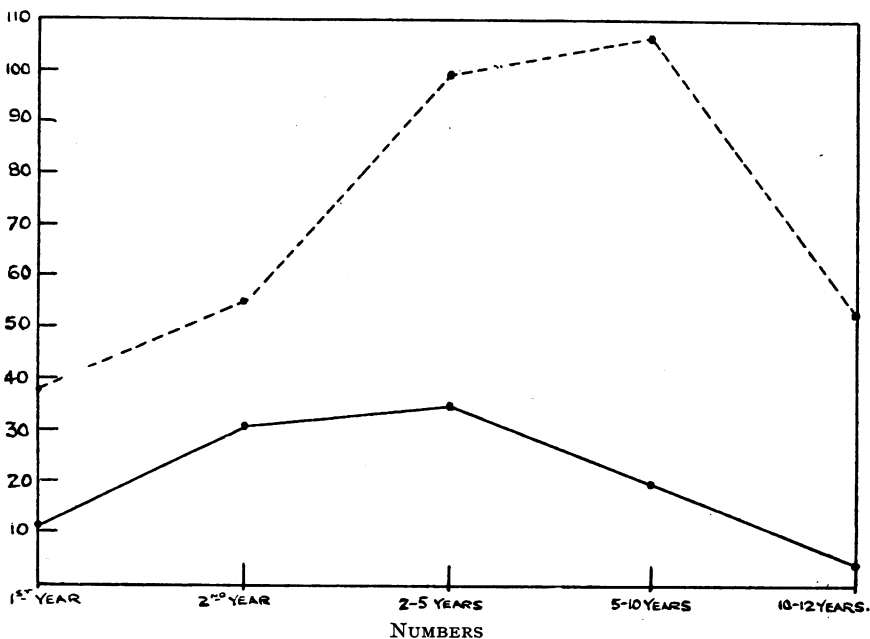
Thirteen per cent. assault reported, but rarely proved.

GRAPH No. 1

Age Incidence : Average per year, 1917 to 1928.

Continuous line = Gonorrhœa.

Broken line = Non-gonorrhœal.



Gonorrhœa—			Non-gonorrhœal—		
1st year . .	Total	Average per year	1st year . .	Total	Average per year
2nd year . .	11	11	2nd year . .	38	38
2-5 years . .	31	31	2-5 years . .	55	55
5-10 years . .	103	34.3	5-10 years . .	297	99
10-12 years . .	96	19.2	10-12 years . .	425	106.3
Not stated . .	7	3.5	Not stated . .	105	52.5
	1			29	
	249			949	

Fifteen per cent. epidemic.

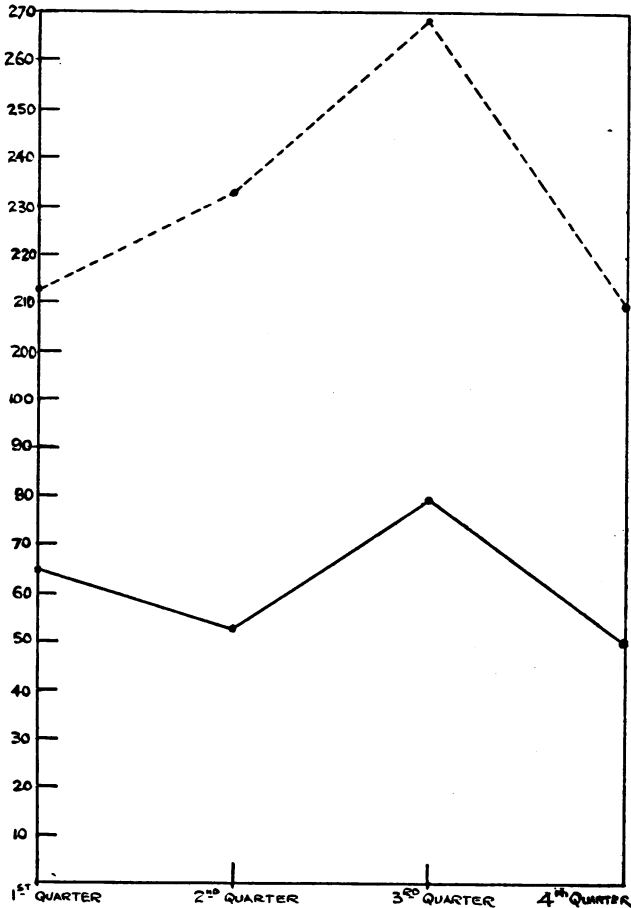
Thirty-two per cent. infection in family.

We have found it very difficult to prove the source of infection in any case. In a few cases it could be inferred with a fair degree of certainty. I am convinced that criminal assault is an extremely rare means of transmission,

VULVO-VAGINITIS

despite the ancient heresy that coitus with a virgin will effect a cure of gonorrhœa in the male. In a few cases an

GRAPH No. 2
Seasonal Incidence, 1917 to 1928.
Gonorrhœa = Continuous line.
Non-gonorrhœal = Broken line.



NUMBERS						
Gonorrhœa—				Non-gonorrhœal—		
1st quarter	Total	1st quarter	Total	1st quarter	Total	
2nd quarter	65	2nd quarter	213	2nd quarter	233	
3rd quarter	53	3rd quarter	268	3rd quarter	209	
4th quarter	79	4th quarter	209	4th quarter	26	
Not stated	50	Not stated	26			
	2					
	<u>249</u>		<u>949</u>			

infected parent has admitted having the child in the same bed. The accompanying table shows the various origins

BRITISH JOURNAL OF VENEREAL DISEASES

of the infection in so far as it could be ascertained. Of 125 cases of gonorrhœa from 1923 to 1929 inclusive, 115 have been investigated. The other 10 have unfortunately been omitted from the analysis. In 50 per cent. no source of origin was suspected, but the mothers were not examined as a routine, and I am inclined to think that they may be a common source.

There is an interesting point in the hospital epidemic at an infants' hospital before mentioned. After the first batch of cases the hospital was closed and reopened after

TABLE I

Presumed Source of Infection

	Totals.
Mother, 9. Also possibly, 4	13
Father, 5	5
Both parents, 2 ; possibly, 1	3
Sister, 3	3
Another female child in the house, possibly, 2	2
Adult relative (other than above) in house, 1 ; possibly, 1	2
Suspected adult in the house unrelated (<i>e.g.</i> , prostitute), therefore ? infection by lavatory, 3 ; possibly, 4	7
Nursemaid, possibly, 1	1
Hospital infection, 11 (8 under 1 year old)	11
School, 3 ; possibly, 1	4
Convalescent Home, 1	1
Day Nursery, possibly, 1	1
Visit to seaside, 2 (one case hotel infection ? lavatory)	2
Alleged Rape, 3 (no definite evidence)	3
	<hr/> 58 <hr/>

Total cases analysed, 115.

Source entirely unknown, 57.

cleaning. Fifty per cent. of the old nursing staff remained on the reopening, and a further epidemic occurred very shortly after. I was therefore inclined to suspect a focus among the remaining 50 per cent. of nurses.

The prophylaxis of the disease depends on the proper education of the infected adult, who should always be warned of the liability of infection of children, particularly, of course, female children. Male children are occasionally infected, however. At some hospitals, I believe, all female children are swabbed on admission, *per vaginam*, but I do not suppose their mothers would like it if they knew.

VULVO-VAGINITIS

SITES OF INFECTION

In describing the clinical appearance of gonorrhœal vulvo-vaginitis I have only mentioned the vulva and vagina. But any or all of the three contiguous orifices may be infected—the vagina, urethra, and rectum. Lees states that in his series 99 per cent. of acute cases had urethral infection, and 2·7 per cent. rectal infection. I am sure that this is much higher than the actual fact as regards the urethra, and too low as regards the rectum. We adopted rectal tests from March, 1926, as a routine, and urethral tests from the end of 1927. The likelihood of obtaining false positives in acute cases was at once apparent. When there is profuse vaginal discharge no precaution will prevent the urethral swab from being contaminated by vaginal secretion. In addition, there is the risk of pushing the infection from the vagina up the still uninfected urethra. Again, when there is external discharge, the perineum and peri-anal skin must be contaminated with it, and the gonococci may be harboured in the rugæ of the latter, which are very difficult to clean thoroughly. I do rectal tests rather earlier than urethral tests, and the peri-anal skin is swabbed thoroughly three times with saline, an ordinary ear speculum introduced just inside the anus, and the swab inserted through it. Films and culture are made. The latter are very likely to be overgrown with *B. coli*. Therefore plates are preferable to sloped tubes.

The urethra is left until the vaginal discharge has ceased, and the vulva is swabbed up twice with saline before the swab is taken. Thus, out of 43 cases, 20 were urethra positive and 22 urethra negative; 1 was a doubtful contamination—nearly 50 per cent. positive.

Rectal examination of 52 cases showed 42 negatives, 9 positives and 1 doubtful; 4·6 positive.

TREATMENT

From the point of view of treatment, I divide our series into two parts: a preliminary period in which we tried all kinds of treatment and had confidence in none, which lasted from the beginning of 1923 to nearly the end of 1925; and the period of 1926 to 1929 inclusive, when the correct line of treatment was arrived at. I might call

BRITISH JOURNAL OF VENEREAL DISEASES

the latter the glycerin period, and after reaching this point it only remained to find the antiseptic to incorporate with the glycerin that was the most effective, if, indeed, pure glycerin alone was not equally effective. It is true that in 1924 we did include in a few cases, among numerous other treatments, packing the vagina daily during consecutive weeks with glycerinum boracis, glycerinum eucalypti, and glycerinum ichthyol, as then recommended by Colonel Harrison. But I did not then pin my faith on these substances and did not persevere. I will only mention early methods in order to dismiss them.

(1) Daily douche of Pot. Permanganate 1/4,000 or Chloramine T. 1/100 to 1/500, followed by insertion of an acriflavine pessary 1/500. In addition, once or twice a week the vagina was swabbed with silver nitrate, starting with 5 per cent. and increasing to 20 per cent.

(2) Swabbing with Mercurochrome 10 to 25 per cent. once or twice weekly was then substituted for silver nitrate. Later this was done under direct vision through Harrison's air distension urethroscope..

(3) Next the vaginal packing system was tried, first with the series of glycerina mentioned above, and then with 1 per cent. picric acid in water, once weekly.

(4) Daily installation of Anasol "A" 10 per cent. (now known as Monsol).

(5) Douching with Mercury Oxycyanide 1/4,000 or douching with normal saline, instead of Permanganate and Chloramine T., in addition to the various above methods.

(6) Douching with 1 per cent. Protargol instead of other douches tried.

(7) Daily installation of 2 per cent. protargol alone.

(8) The insertion of "Spuman" containing 2 per cent. proteinate of silver three times per day. This substance is put up in the form of styli, each of 0.2 or 0.5 gm., according to appropriate size, and when it is moistened, nascent carbon dioxide is evolved and is supposed to drive the contained antiseptic into all nooks and crannies. No douche is given with this treatment.

Finally, the present method, which we advocate, was evolved. It is as follows: For the first week, to accustom the child to treatment, a daily douche only is given. After that the douche is still given in the morning. (I

VULVO-VAGINITIS

do not think that its composition matters much—Permanganate 1/4,000, Mercury Oxycyanide 1/4,000, Chloramine T. 1/1,000, or Milton 1 drachm to a pint of water have been used.) After the douche the child is sat up for half to one hour to drain as much fluid from the vagina as possible. Then the vagina is packed with about 2 feet of ribbon gauze soaked in pure glycerin, or one of the under-mentioned glycerin mixtures. This is done through a duck-bill ear speculum, by means of a probe, and the pack is left in for twenty-four hours, and removed next morning just before the douche. And so the process is repeated as long as is necessary.

The various glycerin mixtures tried have been the following :—

- (1) Acriflavine in glycerin, 1 per cent.
- (2) Protargol in glycerin, 10 per cent.
- (3) Auramine in glycerin 1/30. (This is known as glauramine, and normally contains some alcohol. I had the alcohol omitted, as it impeded the insertion of the pack.)
- (4) Pure glycerin.
- (5) Speton in glycerin, $\frac{1}{2}$ tablet in 1 drachm.

ANALYSIS OF RESULTS

In this analysis infants of under one year old have been omitted, as in them the vagina is too small to pack, and as they are usually cured comparatively easily ; also all those cases in which the treatment was changed from the no-packing method to the packing method during treatment. Neither have I included in the comparative tables those cases that defaulted before cure. The periods compared indicate the period of treatment till the first permanently negative vaginal smear is obtained.

TABLE II

(A) Completed cases treated by various and combined non-packing methods. Total number, 27.

Average period before permanently negative vaginal test, 5.74 *months*.

Longest treatment required in this series, 13 $\frac{1}{2}$ *months*.

Three cases discontinued treatment uncured after 12, 12 and 10 months respectively.

BRITISH JOURNAL OF VENEREAL DISEASES

(B) Completed cases treated by glycerin packing methods. Total number 40.

Average period before permanently negative vaginal test, 4.9 *months*.

Longest treatment required in this series, 12 *months*.

Two cases discontinued treatment uncured after 6 and 2½ *months* respectively.

One case apparently cured after 9 months of treatment and observation for 6 months, again became positive at the end of that period. This case was very possibly re-infected from the mother, though this was never proved.

(C) Comparisons of the results with the various glycerina :—

(a) *Acriflavine* in glycerine 1 per cent. Cases 4. Average period, 3.21 *months*.

(b) *Protargol* in glycerin 10 per cent. Cases 22. Average period, 5.1 *months*.

(c) *Glauramine*. Cases 3. Average period, 6.7 *months*.

(d) *Speton ex glycerin*. Cases 2. Average period, 3.75 *months*.

(e) *Pure glycerin*. Cases 4. Average period, 4 *months*.

Acriflavine cases not doing well, cleared up by	
protargol	2
Glauramine cases	2
Speton cases	1

It would appear from the table that 10 per cent. protargol was inferior to 1 per cent. acriflavine, to speton, and to pure glycerin, but I do not think that this is so, for the following reasons: the protargol series is much larger than the others and contains two or three cases that took an unusually long time to clear up for various reasons, such as irregular treatment as out-patients, interruption of treatment on account of intercurrent disease, and in one case, repeated re-infections of the vagina from the urethra. I have great confidence in protargol in glycerin, as I have never yet failed to clear up a case with it that was not clearing up on other methods. I am prepared to agree that pure glycerin may be just as good without the protargol, but the series of pure glycerin cases is too small to be certain of this.

The anilin dyes, acriflavine and auramine have the great disadvantage of making indelible stains on linen, whereas protargol stains wash out easily with water.

VULVO-VAGINITIS

THE TREATMENT OF INFANTS

We have used two methods : (a) daily installation of 2 per cent. protargol in water into the vagina ; (b) the insertion of styli of Spuman containing 2 per cent. proteinate of silver three times per day.

The complete series comprises 5 cases under 1 year, and 4 cases between 1 and 2 years. Three cases between 1 and 2 years have been included in the former series, treated by various other methods.

The average period in this series required to obtain a permanently negative vaginal test was six and a half weeks. Two cases were cured in three weeks and six weeks respectively with douching only.

COMPLICATIONS

(a) *Cervicitis*.—The cervix uteri is probably infected in most of the cases, and this is thought to be the cause of the difficulty of cure. Schauffler states that the presence of the mucus in the discharge is suggestive of cervical infection. The lesser incidence of cervical infections in small infants may be the reason for the shorter period usually required for cure, particularly under one year old. That it can occur, even in infants, was illustrated by the only fatal case in our series : a child of seven months, who died four days after admission, from peritonitis. Gonococci were cultured from the fundus uteri post-mortem.

In older children endometritis or pelvic peritonitis may give rise to a mistaken diagnosis of appendicitis, and such cases have been operated on. It is an easy mistake, as there is pain, tenderness and rigidity, and pyrexia, and often the vaginal discharge is temporarily suppressed. It is my practice temporarily to suspend treatment other than douching, and to apply hot fomentations to the abdomen.

(b) *No Case of Arthritis, Conjunctivitis or Iritis has occurred in this Series*.—There has been one case of tenosynovitis at the ankle.

(c) *Cystitis has occasionally occurred*.—Hæmorrhage from the urethra or bladder is by no means uncommon during treatment by vaginal pack. It is of no importance, and stops spontaneously.

BRITISH JOURNAL OF VENEREAL DISEASES

(d) We have not seen gonococcal Bartholinitis or paraurethritis.

THE TREATMENT OF URETHRITIS

The only treatment adopted has been swabbing the interior of the urethra daily with silver nitrate solution, starting with 1 per cent. and continuing with 5 per cent. The urethral infection is usually less resistant to treatment than is the vaginal infection.

The Treatment of Rectal Infection.—Two per cent. aqueous solution of protargol is instilled through a catheter and funnel daily, about half an ounce being used, and the child being made to retain it for twenty to thirty minutes. We have had no resistant rectal cases. Permanganate solution 1/4,000 can be used instead.

I do not pretend to have exhausted all the possible methods of treatment of gonorrhoeal vulvo-vaginitis, but to have recounted our experience at Great Ormond Street. For instance, Schauffler² advocates injecting into the vagina anhydrous wool fat impregnated with either 1 per cent. silver nitrate or 5 per cent. mercuriochrome. A special apparatus is required for this.

ADJUVANT TREATMENT

(1) *Vaccines.*—Stock gonococcus vaccines, obtained from Messrs. Boots, and prepared, I believe, at St. Thomas' Hospital, were used in 20 cases. Three of these were uncured after twelve months, twelve months, and ten and a half months respectively. In the other 17 cases the average period of treatment to the first permanently negative vaginal smear was 5.1 months. The average of all cases analysed in Table II is 5.2 months, so that there is nothing in it. I must make it clear that in the three long uncured cases the vaccine was given fairly early in the treatment, and not just because the cases turned out to be long ones. One of the above-mentioned 17 had three injections of Aolan, 3 c.c. per dose, prior to the course of vaccine. The course of the disease was not modified in any way, neither was there any reaction. This particular case took ten months to cure.

Manganese butyrate has not been tried.

Vaccine treatment did not prevent relapses. Therefore

VULVO-VAGINITIS

we have no evidence to offer in favour of vaccine treatment.

The only adjuvant treatment that we recommend is directed to the maintenance of good general health.

Relapses.—These may be clinical, bacteriological, or both. Having eliminated the urethra and rectum as a focus of re-infection of the vagina, the cause of relapse must be from above, that is to say, from the cervix. None of the completed cases under one year old relapsed during or after treatment. One must always remember the possibility of re-infection after the patient has left the hospital on probation, so that I have not thought it worth while to analyse the relapse rate in detail.

Criteria of Cure.—After the subsidence of the acute signs, vaginal smears are made at fortnightly intervals during treatment. When all the orifices are found negative, treatment is continued for a week, and tests again taken. If again negative, no treatment having been given for two weeks, the patient is sent out on probation, and re-tested first after a week, then after two weeks, and finally monthly until negative tests have been consistently obtained for three months in all after return home. Then the patient is regarded as cured unless there are any suspicious features which render a longer period of probation desirable.

I do not regard a persistent mucoid discharge as an indication for continuing treatment, which may be keeping it up.

The Reaction of the Vaginal Secretion I regard as a helpful index. Up to the time of puberty, or shortly before it, the vaginal secretion is normally alkaline. The advent of Döderlein's bacillus ushers in a change to acidity, which is the normal state in adults. I confirmed this normal alkalinity in eight normal females from ages eleven weeks to four and a half years. Older children were not tested in this way for obvious reasons. In all, mixed Gram-negative and Gram-positive organisms were present, with a few leucocytes also in some of them.

From the end of 1924 onwards, the reaction was tested with litmus paper, by applying a vaginal swab to it in all cases. Naturally, when a purulent discharge is present the reaction is alkaline. But during treatment, when the purulent discharge has been got rid of, the reaction becomes acid. After cure, and after suspension of

treatment, the reaction again becomes alkaline, though two or three weeks may be required for this. A persistently acid reaction after suspension of treatment is strong evidence that the case is not cured, despite negative tests, and that there will be a relapse. The converse does not hold good ; alkalinity is not proof of cure in all cases in the absence of discharge. Of 55 cases fully investigated from this point of view, 12 remained alkaline throughout treatment, but in no cases did the reaction remain acid after cure. There was one doubtful case of gonorrhœa, in which the reaction remained acid, but as the age was eleven and a half, a normal acid reaction was possible.

Provocation before Making Tests.—(1) Preliminary installation of silver nitrate. (2) Preliminary injection of gonococcus vaccine, 500 million subcutaneously, or Aolan intramuscularly. We have only very occasionally used these methods, and thus cannot criticise them.

NON-GONORRHOËAL VULVO-VAGINITIS

I have not attempted to give a detailed analysis of these very numerous cases, but shall merely summarise our experience.

Skin conditions that may affect the vulva must at first be dismissed. They are eczema, intertrigo, herpes, impetigo, and rarely diphtheria and noma vulvæ. There is not strictly a vaginitis in these cases.

Age Incidence.—This is highest between five and ten, and next highest between two and five, so that the peak of the age incidence curve is later than in the gonorrhœal cases (refer again to Graph I).

Seasonal Incidence.—This is a little difficult to assess, as these cases are very chronic, and often recurrent, so that the exact time of onset cannot often be given by the parent. Sometimes it is said that the discharge dates from birth. I have recorded the month of onset when this can be given with accuracy, but otherwise have had to record the month in which the patient first attended. Not much, therefore, can be learnt from the statistics, but I give them for what they are worth. Again, the highest incidence is in the third quarter of the year, but there is not the striking difference that is seen in the curve of the gonorrhœal cases (refer again to Graph II).

VULVO-VAGINITIS

If the season has any influence, it can only be in respect of scanty clothing in summer, allowing children to sit in direct contact with doorsteps, etc., or of the hot weather causing more sweating and thus intertrigo.

ÆTIOLOGY

(1) *By Intestinal Organisms.*—This is by far the most common source of infection, and the flora are *B. coli* and intestinal streptococci. The vulval cleft is continuous with the anal cleft and fluid fæces pass forwards by capillary attraction. Wiping the anus in a forward direction after defæcation may play some part.

Associated Conditions.—First and foremost, thread-worms. When no other cause can be found to keep up a persistent non-specific vulvo-vaginitis, their presence can be diagnosed with certainty, despite the protestations of the mother that none are present.

Trauma and Friction.—This is generally obvious from excoriations of the skin of the labia majora and may be due to masturbation or the friction of tight combinations, or occasionally friction resulting from spasticity of the legs when adductor spasm is present. Masturbation may itself be set up by pre-existing irritation arising from eczema, glycosuria, hyperacidity of urine, ammoniacal dermatitis, adherent prepuce or accumulated smegma. In these cases the intestinal organisms may be accompanied by staphylococci and diphtheroid bacilli.

Foreign bodies in the vagina set up a sero-sanguineous discharge, and I recollect one case in which a safety pin, three matches and a hairpin were removed.

Poor health, especially after measles or scarlet fever, and a highly-strung neurasthenic disposition are contributory factors.

(2) Pure diphtheroid infections occur in girls approaching puberty.

(3) *Pneumococcal Infections.*—These have been reported by various observers and have been blamed for primary pneumococcal peritonitis in female children. In our series no such infection has been found in any case, and special cultural investigations have been made by Dr. Veda Perry and later by Dr. Signy on all cases from June, 1926, onwards, in which the strained films contained organisms resembling pneumococci. Thirty-five cases

BRITISH JOURNAL OF VENEREAL DISEASES

were examined, and in all the suspicious cocci turned out to be intestinal streptococci, and as the investigation covered three and a half years, and roughly 300 cases of non-gonorrhœal vulve-vaginitis, we are inclined to doubt the existence of pneumococcal vaginal infection.

DIAGNOSIS

Clinically the discharge in these cases is less profuse than that in acute gonorrhœa, being milky, watery or mucoid, and often offensive. Bacteriologically the above-mentioned organisms are seen, and no gonococci.

In the pure diphtheroid cases there is no inflammatory reaction, the diphtheroids being non-pathogenic. There is a slight opalescent discharge, and the mucous membrane has a pearly pink appearance. A foreign body, if suspected, is sought by means of Harrison's air distension vaginoscope.

TREATMENT

The main necessity is to eliminate the associated condition, whatever it may be, and then the valvo-vaginitis will clear up. Thread-worms must be got rid of, masturbation controlled, or the tight combinations discarded. Tonics should be given if required. Locally, bathing twice daily with Chloramine T 1/500 to 1/1,000 and a dusting powder of zinc oxide and starch is all that is required. In older girls local treatment is best avoided for psychological reasons.

The pure diphtheroid infections are not amenable to any treatment, and are of no importance, and therefore should not be treated. In the early days we attempted to treat these by local means, and in one case by an autogenous vaccine, without success.

After the cure of gonorrhœa, a mucoid discharge containing secondary organisms may persist for some time. This tends to spontaneous recovery. In two cases I attempted to remedy this condition by trying to implant *B. bulgaricus* in the vagina, a culture in milk being installed and the patient's buttocks raised for half an hour. In no case did the organism survive or multiply.

COMPLICATIONS

There are none, if we dismiss the alleged pneumococcal peritonitis secondary to vaginal infection.

VULVO-VAGINITIS

THE REACTION OF THE VAGINAL SECRETION

This is always alkaline in non-specific cases, with the one exception of the pure diphtheroid infections, in which case the reaction is strongly acid.

REFERENCES

- (1) DR. DAVID LEES. *Proceedings of Edinburgh Obstet. Soc.*, II.1.28, and *Brit. Med. Journ.*, II.2.28.
- (2) SCHAUFFLER. *American Journal Children's Disease*, October, 1927.